AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Currently Amended) A process for producing fumed metal oxide particles comprising:

(a) providing a reactor comprising ~~(1)~~ a combustion chamber having ~~a first internal diameter, (2)~~ one or more inlets~~, (3) a constricted~~ <u>and an</u> outlet ~~portion having a second internal diameter, and (4) an enlarged outlet portion having a third internal diameter~~, wherein material to be combusted flows via the one or more inlets into the combustion chamber where the material is combusted to form a combustion gas, which flows out of the combustion chamber via the ~~constricted~~ outlet ~~portion and then to the enlarged outlet portion, and wherein the second internal diameter of the constricted outlet portion is smaller than the first internal diameter of the combustion chamber, and the third internal diameter of the enlarged outlet portion is larger than the second internal diameter of the constricted outlet portion~~,

(b) providing one or more streams of an oxidant and a liquid or gaseous fuel and delivering the oxidant and liquid or gaseous fuel via the one or more inlets to the combustion chamber,

(c) combusting the oxidant and liquid or gaseous fuel in the combustion chamber to form a stream of combustion gas which flows out of the combustion chamber ~~into and through the constricted outlet portion and then to the enlarged outlet portion~~ <u>via the outlet,</u>

(d) providing a stream of a liquid feedstock comprising a volatizable non-halogenated metal oxide precursor and injecting the stream of the liquid feedstock into the stream of combustion gas ~~while the stream of combustion gas flows through the constricted outlet portion~~ to thereby atomize the liquid feedstock within the stream of combustion gas and form a reaction mixture comprising the combustion gas and the atomized liquid feedstock, ~~which reaction mixture flows to the enlarged outlet portion,~~

(e) subjecting the atomized liquid feedstock to a sufficient temperature and residence time in the stream of combustion gas for the liquid feedstock to combust or pyrolyze and thereby be converted to fumed metal oxide particles,

(f) reducing the temperature of the stream of combustion gas below the solidifying temperature of the fumed metal oxide particles, and recovering the fumed metal oxide particles.

2. (Original) The process of claim 1 further comprising quenching the reaction mixture.

3. (Original) The process of claim 2, wherein the reaction mixture is quenched by air.

4. (Original) The process of claim 2, wherein the reaction mixture is quenched by steam.

5. (Original) The process of claim 2, wherein the reaction mixture is quenched by water.

6. (Original) The process of claim 2, wherein the stream of the liquid feedstock is injected into the stream of combustion gas inside a reactor having walls and the reaction mixture is quenched by heat transfer to the walls of the reactor.

7. (Previously Presented) The process of claim 1, wherein the metal oxide precursor is a silicon-containing compound.

8. (Previously Presented) The process of claim 7, wherein the silicon-containing compound is selected from the group consisting of silicates, silanes, polysiloxanes, cyclic polysiloxanes, silazanes, and mixtures thereof.

9. (Previously Presented) The process of claim 8, wherein the silicon-containing compound is selected from the group consisting of tetraethoxyorthosilicate,

tetramethoxyorthosilicate, tetramethoxysilane, tetraethoxysilane, methyltriethoxysilane, dimethyldimethoxysilane, dimethyldiethoxysilane, trimethylmethoxysilane, trimethylethoxysilane, diethylpropylethoxysilane, silicone oil, octamethylcyclotetrasiloxane, decamethylcyclopentasiloxane, dodecamethylcyclohexasiloxane, hexamethyl-cyclotrisiloxane, hexamethyldisilazane, and mixtures thereof.

10. (Previously Presented) The process of claim 8, wherein the silicon-containing compound is selected from the group consisting of methyltrimethoxysilane, octamethylcyclotetrasiloxane, and mixtures thereof.

11. (Original) The process of claim 1, wherein the metal oxide precursor is selected from the group consisting of aluminum(III) n-butoxide, aluminum(III) sec-butoxide, aluminum(III) isopropoxide, trimethylaluminum, and mixtures thereof.

12. (Previously Presented) The process of claim 1, wherein the liquid feedstock comprises a silicon-containing compound and at least one compound selected from the group consisting of aluminum(III) n-butoxide, aluminum(III) sec-butoxide, aluminum(III) isopropoxide, and trimethylaluminum.

13. (Previously Presented) The process of claim 1, wherein the oxidant stream is heated prior to combustion with the liquid or gaseous fuel stream.

14. (Previously Presented) The process of claim 1, wherein the oxidant stream is selected from the group consisting of air, oxygen, and mixtures thereof.

15. (Previously Presented) The process of claim 1, wherein the fuel stream comprises a hydrocarbon.

16. (Original) The process of claim 15, wherein the hydrocarbon fuel stream is selected from the group consisting of natural gas, methane, acetylene, alcohol, kerosene, and mixtures thereof.

17. (Previously Presented) The process of claim 1, wherein the fuel stream comprises hydrogen.

18. (Original) The process of claim 1, wherein the stream of the liquid feedstock is injected into the stream of combustion gas through at least one nozzle.

19. (Original) The process of claim 18, wherein the nozzle is a single fluid nozzle.

20. (Original) The process of claim 18, wherein the nozzle is a bi-fluid nozzle.

21. (Original) The process of claim 18, wherein the liquid feedstock is injected into the stream of combustion gas through two or more nozzles.

22. (Original) The process of claim 21, wherein at least one of the nozzles is located downstream of the other nozzle.

23. (Original) The process of claim 1, wherein the metal oxide particles are formed by pyrolysis.

24. (Original) The process of claim 23, wherein the reaction mixture is contacted with CO_2 or H_2O to increase oxidation prior to the reduction of the combustion gas temperature below the solidifying temperature of the fumed metal oxide particle.

25. (Previously Presented) A composition comprising about 2000 or more fumed silica aggregates having a primary particle size d and an aggregate size D_{circ}, wherein the average of the primary particle sizes d_{ave}, the average of the aggregate sizes $D_{circ\ ave}$, and the geometric standard deviation of the aggregate sizes $\sigma_g\ (D_{circ})$ satisfy one or both of the following equations:

(1) $D_{circ\ ave}$ (nm) $< 52 + 2 \times d_{ave}$ (nm)

(2) $\sigma_g\ (D_{circ}) < 1.44 + 0.011 \times d_{ave}$ (nm).

26. (Original) The composition of claim 25, wherein the fumed silica particles have a surface area, and the primary particle size d is calculated from the surface area SA according to the following equation:

$$d\ (\text{nm}) = 1941/SA\ (\text{m}^2/\text{g}).$$

27. (Original) The composition of claim 26, wherein equation (1) is satisfied.

28. (Original) The composition of claim 26, wherein equation (2) is satisfied.

29. (Original) The composition of claim 26, wherein both equations (1) and (2) are satisfied.

30. (Original) The composition of claim 25, wherein the composition comprises about 5000 or more fumed silica aggregates.